

CLAIMS

What is claimed is:

1. An optical coupler comprising:
 - an input polarization maintaining optical fiber having a polarization axis;
 - at least one optical component optically coupled to said input optical fiber, said at least one optical component splitting an input light beam received from said at least one optical component into a first output light beam having a first polarization state and a second output light beam having a second polarization state; and
 - at least a first and a second output optical fiber to receive said first and second output light beams, respectively;
 - wherein changing an angular orientation of said polarization axis relative to an optical axis of said at least one optical component changes a coupling ratio.
2. The optical coupler of claim 1, wherein said optical component is a polarization beam splitter.
3. The optical coupler of claim 2, wherein said polarization beam splitter is a crystal pair selected from the group consisting of: yttrium vanadium oxide, lithium niobate, calcite, α -BBO, Quartz and rutile.

4. The optical coupler of claim 1, wherein said optical component is one of a birefringent crystal, a Wollaston prism and a Rochon prism.
5. The optical coupler of claim 1, wherein said input fiber is mounted in a ferrule.
6. The optical coupler of claim 5, wherein said ferrule is mounted in a housing and said housing further holds a lens to focus said input beam into said optical component.
7. The optical coupler of claim 6, wherein said input fiber has an endface cut at an angle.
8. The optical coupler of claim 7, wherein said angle is between about 5 degrees and about 15 degrees and wherein said angle is aligned with an optical axis of said PM fiber.
9. The optical coupler of claim 5, wherein said ferrule is mounted in a housing and said housing further holds a lens to collimate said input beam into said optical component.
10. The optical coupler of claim 1, further comprising a lens optically coupled to said input polarization maintaining fiber, said lens focusing said first

and second output beams from said optical component onto said first and second output fiber, respectively.

11. The optical coupler of claim 1, wherein said optical component is rotated with respect to said input fiber, but fixed with respect to said output fibers, to change said coupling ratio while maintaining a low insertion loss.

12. The optical coupler of claim 1, further comprising a plurality of optical components that split said input light beam into a plurality of output light beams, each of said plurality of output light beams being focused onto a plurality of output fibers, respectively.

13. The optical coupler of claim 1 wherein each of said first and second output fibers are one of a polarization maintaining fiber and a single mode fiber.

14. The optical coupler of claim 1, wherein said optical component and said first and second output fibers are rotated together with respect to said input fiber to change said coupling ratio.

15. An optical coupler comprising:
- an input polarization maintaining optical fiber, said input fiber being contained in a ferrule, said ferrule being housed in a housing;
 - at least one optical component optically coupled to said input fiber, said at least one optical component splitting an input light beam into a first output light beam and a second output light beam; and
 - at least a first and a second output optical fiber to receive said first and second output light beams, respectively;
- wherein rotation of said input polarization maintaining fiber with respect to said at least one optical component changes a coupling ratio.
16. The optical coupler of claim 15, wherein said housing further holds a lens to focus said input beam into said optical component.
17. The optical coupler of claim 16, wherein said input fiber has an endface cut at an angle.
18. The optical coupler of claim 17, wherein said angle is between about 5 degrees and about 15 degrees and wherein said angle is aligned with an optical axis of said PM fiber.
19. The optical coupler of claim 15, wherein said housing further holds a lens to collimate said input beam into said optical component.

20. The optical coupler of claim 15, further comprising a lens to focus said first and second output beams from said optical component onto said first and second output fiber, respectively.

21. The optical coupler of claim 15, wherein said optical component is rotated with respect to said input fiber, but fixed with respect to said output fibers, to change said coupling ratio while maintaining a low insertion loss.

22. The optical coupler of claim 15, further comprising a plurality of optical components that split said input light beam into a plurality of output light beams, each of said plurality of output light beams being focused onto a plurality of output fibers, respectively.

23. The optical component of claim 15 wherein said housing contains a window showing an orientation of an optical axis of said polarization maintaining fiber.

24. A method of adjusting a coupling ratio, the method comprising:
- receiving an input light beam from an input polarization maintaining optical fiber;
- splitting said input light beam into at least a first output light beam and a second output light beam using an optical component;
- optically coupling said first and second output light beams to a first and second output fiber, respectively; and
- rotating said input polarization maintaining optical fiber with respect to said optical component to change said coupling ratio.
25. The method of claim 24, wherein said optical component is a polarization beam splitter.
26. The method of claim 25, wherein said polarization beam splitter is a crystal pair selected from any one of: yttrium vanadium oxide, lithium niobate, calcite, α -BBO, Quartz, and rutile.
27. The method of claim 24, wherein said input fiber is mounted in a ferrule, and said ferrule is mounted in a housing.
28. The method of claim 27, wherein said housing further holds a lens to focus said input beam into said optical component.

29. The method of claim 28, wherein said input fiber has an endface and wherein said endface is cut at an angle.

30. The method of claim 29, wherein said angle is between about 5 degrees and about 15 degrees and wherein said angle is aligned with an optical axis of said polarization maintaining fiber.

31. The method of claim 27, wherein said housing further holds a lens to collimate said input beam into said optical component.

32. The method of claim 24, further comprising a lens to focus said first and second output beams from said optical component onto said first and second output fiber, respectively.

33. The method of claim 24, wherein said optical component is rotated with respect to said input fiber, but fixed with respect to said output fibers, to change said coupling ratio while maintaining a low insertion loss.

34. The method of claim 24, further comprising a plurality of optical components that split said input light beam into a plurality of output light beams, each of said plurality of output light beams being focused onto a plurality of output fibers, respectively.

35. The method of claim 34, wherein at least one of said output fibers is a polarization maintaining fiber.

36. The method of claim 34, wherein at least one of said output fibers is a single mode fiber.

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